Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Shri Vaishnav Institute of Technology and Science
Department of Electrical and Electronics Engineering
Choice Based Credit System (CBCS) in the Light of NEP-2020

COURSE CODE	CATE-GORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
GUEE401	GE	IOT for Automation	60	20	20	30	20	4	0	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):
The objective of this course is to-
1. To understand the Architectural Overview of IoT.
2. To understand the IoT Reference Architecture and Real-World Design Constraints.
3. To understand the various IoT Protocols.

Course Outcomes (COs):
After completion of this course the students will be able -
1. To learn about IoT architecture and various protocols.
2. To learn about the components for design.
3. To implement IoT systems for various applications.

Syllabus

UNIT I **5 Hrs.**
Overview: Overview of Internet of Things: Definition, IOT Vision, Smart Devices, IoT Conceptual Framework, IoT Architectural View, Components of IoT System, Examples of IoT in industrial and home automation.

UNIT II **6 Hrs.**
IOT Technologies: Basic building blocks, Design standards for IOT Systems, Wireless communication technologies: NFC, RFID, Bluetooth, ZigBee, WiFi, LoRa. Wired Communication technologies: UART, SPI, I2C, Ethernet.

UNIT III **7 Hrs.**
IOT Devices: Relays, Display, Switches, Actuators, Overview of various sensors such as Light, Temperature, Weight, Gas, Pressure, Proximity, Motion Sensors, Ultra Sonic, Light (LDR, Photo Diode).

UNIT IV **7 Hrs.**
Prototyping And Designing: Prototyping embedded device software: Arduino platform using IDE, Raspberry Pi IDE, Ethernet and WiFi Library. Software development for Gateways, Internet and web/cloud services.

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UNIT V **5 Hrs.**

IOT Applications and Case Studies: Smart home automation, Industrial automation, Smart agriculture, Irrigation systems, Smart energy management, smart grid, Healthcare, Environmental monitoring and Smart Cities.

Text Books:

1. Raj Kamal, "Internet of Things: Architecture and Design Principles", McGraw Hill, First Edition, 2018.
2. Vijay Madisetti and Arshdeep Bahga, **"**Internet of Things (A Hands-on- Approach)**",** 1st Edition, University Press, 2019.
3. V. K. Khanna, *IoT Sensors: An Exploration of Sensors for Internet of Things*. London, UK: CRC Press, 2025.

References:

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, **"**From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence**",** 1st Edition, Academic Press, 2014.
2. Peter Waher**, "**Learning Internet of Things", PACKT publishing, Birmingham, UK, 2015.
3. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", Springer, 2011.